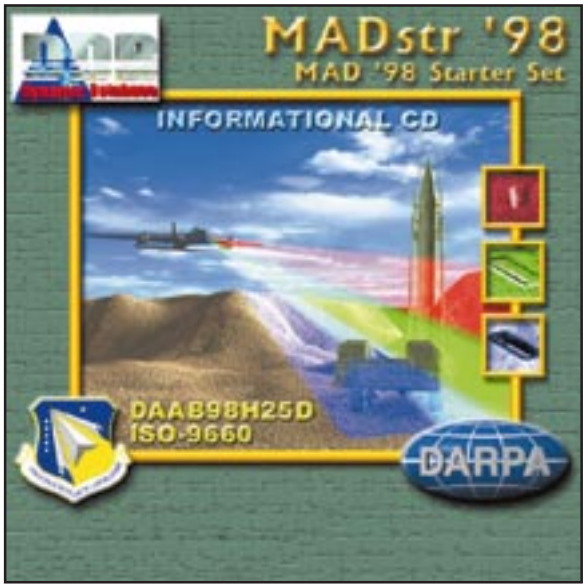
New Software Accelerates Automatic Target Recognition Development



Payoff

By using a common data set throughout the international automatic target recognition (ATR) research community, both time and money are saved as a result of the need for fewer man hours to gain research results. Collaboration has gone from nearly impossible to an easy common practice that results in the acceleration of algorithm development for use in ATR, a key element of the Air Force's defense program.

Accomplishment

Researchers from the Air Force Research Laboratory's (AFRL's) Sensors Directorate (SN) and Veridian Engineering Inc., Dayton, OH, developed and transitioned high-quality sensor data products to industry, academia, and other government agencies. The purpose of this data transition is to provide common target signature data vital in the development of ATR software to an international community, saving researchers worldwide, both time and money, while accelerating the development of ATR systems.

Background

ATR is a critical technology development area within the Department of Defense and the Air Force. One challenge faced by the ATR research community is gaining access to a good set of data to train and test algorithms. A larger challenge for ATR researchers is finding a set of data that can be used by multiple research groups so that research results can be compared. Until recently, security restrictions limited access to data sets. Researchers might have had a common data set within a specific group, but other research groups could not gain access. Prior to the development and transition of the data set, common practice was for one group to test algorithms with data set "A" and another group to use data set "B." In order for data to be shared, one or both groups would rework their calculations with the other's data set. This caused a constant segmentation problem within the ATR research community that resulted in duplicated efforts and slowly developed results. However, by collecting a subset of data used for DARPA's MSTAR and Dynamic Database programs and having it approved for public release, the international ATR research community can now work with a common set of data. Data sets can be generated and distributed in two weeks compared to a data collection that can take five months from collection planning to data delivery. The ATR Data Management Environment, developed using leading edge commercial-off-the-shelf technology to provide a storage system currently holding more then a terabyte of signature data, enables the transition of legacy data from program to program. Data is requested via the World Wide Web and distributed on CDROM. Currently, AFRL has an established customer base of over 230 users and has distributed more than 1,000 CD sets. The database comes in many forms from publicly releasable, to classified. Distribution is appropriately limited. www.mbvlab.wpafb.af.mil/public/SDMS.